4.2.6.4 Water Resources

Impacts associated with the construction and operation of the potential long-term storage facilities at SRS would affect water resources. The proposed facilities would be located outside the 100-year floodplain. Information on the location of the 500-year floodplain at SRS is currently available only for a limited number of specific project areas, but this information could be developed in future environmental documentation. Groundwater would be used for construction and operation of the facilities. The water withdrawals from groundwater would not affect regional groundwater levels. No wastewater would be discharged directly to groundwater, so groundwater quality would not be affected. Any construction-related impacts would be mitigated by standard erosion control practices. During operation of the facilities, treated wastewater would be discharged to nearby streams. All discharges would be monitored to comply with permit limits. During operation, stormwater runoff would be collected and treated, if necessary, before discharge to natural drainage channels. Table 4.2.6.4–1 presents No Action water resources uses and discharges and the potential change resulting from long-term storage alternatives.

No Action Alternative

Surface Water. [Text deleted.] A description of the activities that would continue at SRS is provided in Section 3.7. Because the K-Reactor is shutdown with no provisions for restart, surface water withdrawals from the Savannah River would decrease from 140,400 million l/yr (37,100 million gal/yr) to 127,000 million l/yr (33,600 million gal/yr), or 2.6 percent of the river's minimum flow, by the year 2005. As a result of reduced discharges to site streams, water quality would improve. Treated wastewater discharged is expected to continue at a rate of 700 million l/yr (185 million gal/yr).

Groundwater. Under this alternative, no additional impacts to groundwater resources are anticipated beyond those of existing and future activities, which are independent of and not affected by the proposed action. Groundwater withdrawals for operations of facilities at SRS are expected to remain the same as current usage of 13,247 million l/yr (3,500 million gal/yr) by the year 2005. With the K-Reactor shutdown, and, given the continued implementation of strict waste handling/management practices, it is expected that groundwater quality would not be further degraded.

Upgrade Alternative

Preferred Alternative: Upgrade With All or Some Rocky Flats Environmental Technology Site Non-Pit Plutonium Subalternative

Modify Actinide Packaging and Storage Facility for Continued Plutonium Storage

Surface Water. No surface water withdrawals would be made. Groundwater would be used for construction and operation of the F-Area facilities. The primary surface water impacts during construction would result from soil erosion of disturbed land and siltation of surface drainage channels. To minimize soil erosion impacts, stormwater management and erosion control measures would be employed. In most cases, impacts from runoff would be temporary and manageable. During operation, stormwater runoff would be collected, monitored, and treated, if necessary, before discharge to natural drainage channels.

During construction of the new F-Area facilities, sanitary wastewater (approximately 1.7 million l/yr [0.4 million gal/yr]), would be generated and discharged to the sitewide wastewater treatment system, which would not require any modifications to this system. This would represent a 0.2-percent increase in the effluent from this facility. During operation, approximately 1.5 million l/yr (0.4 million gal/yr) of sanitary wastewater would be discharged to this wastewater treatment system. This would represent a 0.2-percent increase in the effluent discharged to Fourmile Branch from this facility. All discharges would be monitored to comply with discharge requirements. Minimal impacts are expected.

The annual quantities of cooling water blowdown and steam condensate generated would be 3.78 million l (1 million gal) and 2.0 million l (530,000 gal), respectively. Cooling system blowdown would be routed to existing storm drains. Steam condensate from heating would also be routed to the storm drain after quenching. Condensation from air conditioning would be recycled as cooling water makeup. All discharges would be monitored. Fire sprinkler water and truck hosedown water would be collected in tanks, monitored for radioactivity, and then transferred by pipeline or tanker to sanitary waste treatment or the ETF as required. Uncontaminated water would be pumped to storm drains.

The potential location of the new F-Area storage facility is outside the 100-year floodplain. Information on the location of the 500-year floodplain at SRS is currently available only for a limited number of specific project areas. However, the new storage facility at SRS would not likely affect, or be affected by the 500-year floodplain of either the Fourmile Branch or Upper Three Runs Creek because the facility would be located at an elevation of about 91 m (300 ft) above mean sea level (MSL) and is approximately 33 m (107 ft) and 64 m (210 ft) above these streams and at distances from these streams of 0.8 km (0.5 mi) to 1.5 km (0.94 mi), respectively. The maximum flow that has occurred on the Upper Three Runs Creek was in 1990, with a flow rate of about 58 m^3/s (2,040 ft^3/s). At that time the creek reached an elevation of almost 30 m (98 ft) above MSL (SR USGS 1996a:1). The elevation of the buildings in F-Area are more than 62 m (202 ft) above the highest flow elevation of the Upper Three Runs Creek. The maximum flow that has occurred on the Fourmile Branch was in 1991 with a rate of approximately 5 m^3/s (186 ft^3/s), and an elevation of about 61 m (199 ft) above MSL (SR USGS 1996a:1). Elevations of the buildings in F-Area are more than approximately 31 m (101 ft) higher than the maximum flow level that has occurred.

Groundwater. Water requirements during construction would be approximately 2.2 million l/yr (0.6 million gal/yr), which would represent a much less than 1-percent increase over the projected annual No Action groundwater withdrawal. This additional withdrawal should cause minimal impacts to groundwater availability. During operation, water used for cooling system makeup would be obtained from existing supply systems in the F-Area. The water for these systems is groundwater from the Cretaceous Aquifer. Water requirements shown in Table 4.2.6.4–1 represent a maximum of 0.05 percent of the present groundwater usage at SRS. These additional withdrawals would have minimal impact on regional groundwater levels. Previous studies using numerical simulations of groundwater withdrawals over 100 times greater than that required for the F-Area facilities from the Cretaceous Aquifer indicate that drawdown could be almost 2.1 m (7 ft) at the well head, but would be smaller in overlying aquifers and would not extend beyond SRS boundaries in any aquifer (DOE 1991c:5-196). Based on this analysis, it is expected that the withdrawals attributed to the upgraded Pu storage facilities would have a minor drawdown at the well head and would not affect any aquifers in the area.

Construction and operation of the proposed upgraded Pu storage facilities would not result in direct discharges to groundwater. Impacts to groundwater quality are therefore not expected. Since the supply wells draw from the deep Cretaceous Aquifer, the existing plume in the near surface aquifer under the F-Area should not be affected by the upgraded Pu storage facilities.

[Text deleted.]

Upgrade With All or Some Rocky Flats Environmental Technology Site Plutonium and Los Alamos National Laboratory Plutonium Subalternative

Modify Actinide Packaging and Storage Facility for Continued Plutonium Storage

Surface Water. Impacts to surface water from this subalternative are similar to those discussed above for the Upgrade with RFETS Non-Pit Pu Material Subalternative. During both construction and operation, the quantities of wastewater discharged to the sitewide wastewater treatment system would be slightly greater than for the previous subalternative. As shown in Table 4.2.6.4–1, the increases in wastewater discharge during

construction and operation are 0.1-percent grater than those for the previous subalternative; no impacts are expected. Other surface water impacts are identical to those discussed above for the previous subalternatives.

Groundwater. Impacts to groundwater from this subalternative are also similar to those discussed above for the Upgrade with RFETS Non-Pit Pu Material Subalternative. Water requirements during construction and operation of this subalternative are slightly greater than for the previous subalternative. The quantities required for this subalternative represent a maximum increase of 0.05-percent over the No Action groundwater requirements; no impacts to groundwater availability are expected. Impacts to groundwater quality are not expected to be minimal for the same reasons described above for the previous subalternative.

Consolidation Alternative

Construct New Plutonium Storage Facility

The impacts associated with a new consolidated Pu storage facility are the same as those discussed above for the new F-Area facility, with the following exceptions. The water requirements of this alternative are greater than those for the previous alternative. This alternative would require approximately 85 million l/yr (22.5 million gal/yr) and 360 million l/yr (95 million gal/yr) of water for construction and operation, respectively. These additional requirements represent 0.6- and 2.7-percent increases, respectively, in the projected annual withdrawals from the Cretaceous Aquifer. Based on the previous discussion of potential groundwater level declines due to increased withdrawals, minor declines at the well head could be expected to occur from these additional withdrawals during construction. Water requirements during operation are approximately 7 percent less than the quantity analyzed in the groundwater level decline study previously discussed. Based on the results of that study, minimal impacts to regional groundwater levels are expected.

Sanitary wastewater quantities generated during construction and operation of this alternative are approximately 8 million l/yr (2.1 million gal/yr) and 169 million l/yr (44.6 million gal/yr), respectively. These effluents would be treated at the sitewide wastewater treatment system and then discharged to Fourmile Branch. This quantity of additional wastewater during operation would represent a 24.1-percent increase in the effluent discharged to Fourmile Branch from this facility. The sitewide wastewater treatment system can control its effluent flow to Fourmile Branch, and restrictions are specified in the NPDES permit.

Surface water would not be used for this alternative, so no impacts to surface water availability would occur. The area proposed for the new Pu storage facility is outside the 100-year floodplain. No assessment of the 500-year floodplain has been conducted in this area but could be developed during the siting process.

Collocation Alternative

Construct New Plutonium and Highly Enriched Uranium Storage Facilities

Because the consolidated and collocated storage facilities would be located in the same area as the Pu storage facility (that is, northeast of the Z-Area at SRS), the impacts associated with it are the same as those discussed above, with the following exceptions. The water requirements for construction and operation of this alternative are slightly greater. This alternative would require approximately 104.7 million l/yr and 460 million l/yr (27.7 million gal/yr and 121.5 million gal/yr) for construction and operation, respectively. These additional requirements represent 0.8- and 3.5-percent increases, respectively, in the projected annual withdrawals from the Cretaceous Aquifer. Based on the previous discussion of potential groundwater level declines due to increased withdrawals, minor declines at the well head during construction could be expected to occur. Water requirements during operation would be approximately 18 percent greater than those analyzed during the potential groundwater level decline previously discussed. Impacts from these additional withdrawals would be analyzed in tiered NEPA documents, as appropriate.

Sanitary wastewater quantities generated during construction and operation of this alternative would be greater than for the previous alternative and are approximately 13.0 million l/yr and 215 million l/yr (3.4 million gal/yr and 56.8 million gal/yr), respectively. These effluents would be treated at the sitewide wastewater treatment system and then discharged to Fourmile Branch. This quantity of additional wastewater during operation would represent a 30.7-percent increase in the discharge to Fourmile Branch and would be approximately 4.3 percent of the minimal flow. [Text deleted.]

Subalternative Not Including Strategic Reserve and Weapons Research and Development Materials

Water resource impacts during construction and operation for this subalternative are expected to be slightly less than those for the No Action Alternative, the Upgrade With All or Some RFETS Pu and LANL Pu Subalternative, the Consolidation Alternative, and the Collocation Alternative because of the reduction in the amount of material. [Text deleted.]

Phaseout

For phaseout of the current Pu storage mission at SRS, groundwater withdrawals from the Cretaceous aquifer and nonhazardous wastewater discharge to Fourmile Branch would decrease by negligible quantities. By decreasing groundwater withdrawals, SRS would lessen its impact on the Cretaceous Aquifer by a negligible amount. Lowering wastewater discharges to Fourmile Branch by this quantity should not cause or alleviate any noticeable impacts.

[Text deleted.]